

New species and collections of Opiliones (Arachnida) from Turkey

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Abstract — Collections of 22 species of harvestmen are reported from Turkey. Three are new to science: *Histicostoma mitovi* sp. n., *H. gruberi* sp. n. and *Egaenus turcicus* sp. n. Three species, *Odiellus zecariensis* Mkhedze 1952, *Opilio insulae* Roewer 1956 and *Opilio* sp., are reported from Turkey for the first time. Illustrated descriptions are provided for new and poorly known species.

Key words — Harvestmen, new species, new record, checklist, fauna

Introduction

The harvestmen fauna of Turkey is not adequately known. Information about Opiliones from the region is scattered among different faunistic and taxonomic papers. The first species of harvestmen were reported from the country by Kulczyński (1903). He described three new species: *Egaenus crista* var. *anatolicus* (currently = *Zachaeus a.*), *Platybunus strigosus olympicus* (currently = *Rafalskia olympica*) and *Nemastoma weneri* (currently = *Paranemastoma weneri*). The next paper was by Nosek (1905) and reported six species from Turkey, four of which were described as new: *Phalangium kulczynskii* (currently = *Dasylobus k.*), *Phalangium argaeicum* (currently = *Dasylobus kulczynskii*), *Phalangium strandi* (currently = *Metaphalangium s.*) and *Egaenus marenzelleri*. A very important contribution to the study of Turkish harvestmen was made by Roewer (1923, 1950, 1956, 1957, 1959, 1962). In his series of papers, Roewer reported or described as new 26 species of Opiliones from Turkey. Another new species, *Zachaeus orchimonti*, was described by Giltay (1933). Further, 18 species were described or reported from Turkey by Gruber and Šilhavý (Gruber 1963, 1968, 1969, 1976, 1978, 1979, 1998; Šilhavý 1955). Six species of harvestmen were reported by Martens in his survey of the European fauna and revision of Nemastomatidae (Martens 1978, 2006). Currently studies of the Turkish fauna of Opiliones are being conducted by several Turkish arachnologists: A. Bayram, İ. Çorak, N. Yiğit, K. Kurt and others (Çorak 2004; Çorak & Bayram 2007; Bayram & Çorak 2007; Yiğit et al. 2007; Kurt et. al. 2008a,b, 2010, 2011; Bayram et al. 2010). They reported dozen of species, some of which were new to the fauna of Turkey: *Lacinius ephippiatus* C. L. Koch 1835, *Opilio parietinus* (De Geer 1778), *Phalangium opilio* Linnaeus 1761, *Metaplatybunus petrophilus* Martens 1965, *Oligolophus tridens* (C. L. Koch

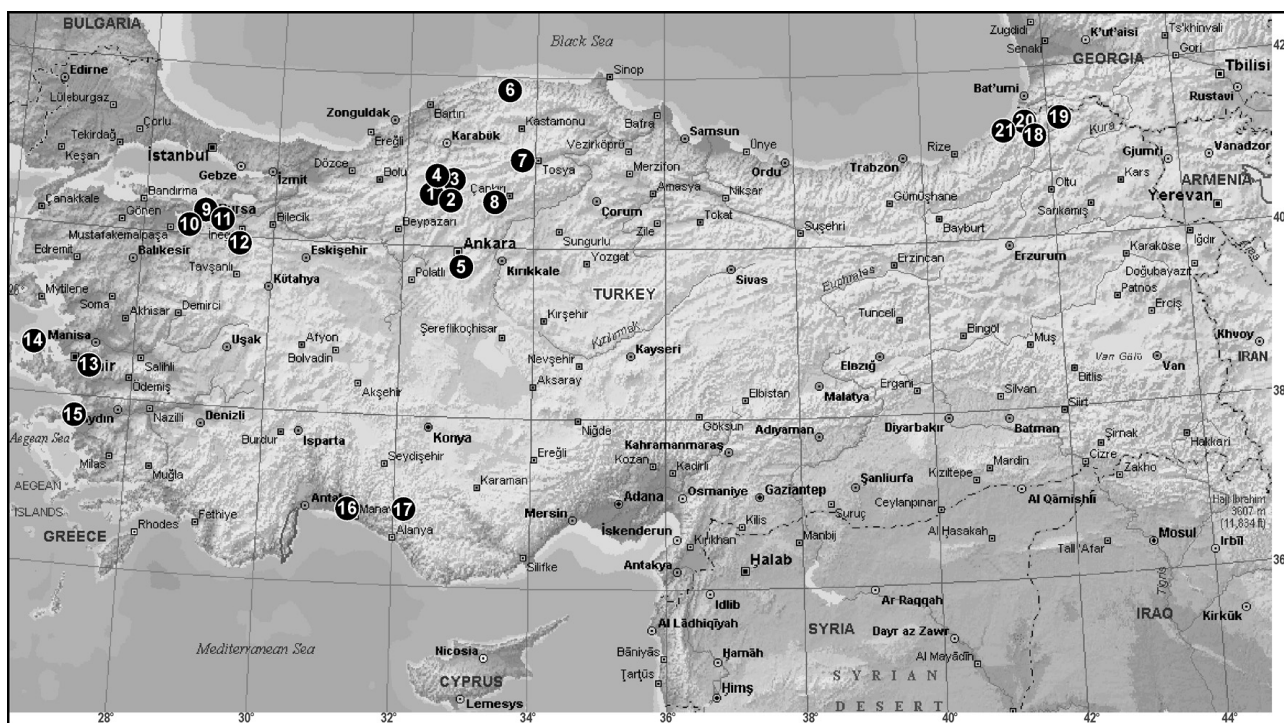
1836), *Oligolophus hanseni* (Kraepelin 1896), *Odiellus lendli* (Soerensen 1894), *Homolophus funestus* L. Koch 1877, *Opilio lederi* Roewer 1911, *Leiobunum rotundum* (Latrielle 1798), *L. rupestre* (Herbst 1799), *Mitopus morio* (Fabricius 1779), *Nelima pontica* Charitonov 1941 and *Ischyropsalis helwigii* (Panzer 1794). In total 65 species and one subspecies belonging to seven families were known in Turkey (Kurt et. al. 2010, 2011; Kunt & Yıldız 2010).

The present paper is largely based upon new specimens of Opiliones that were collected during a Turkish-Russian Arachnological expedition in 2009. A few other specimens are newly reported from the collection of the American Museum of Natural History and one species collected by a Finnish colleague P. T. Lehtinen. Judging from the figures provided in earlier papers and our knowledge about distributions of Palearctic Opiliones, it is very likely that some of these previous records are based upon misidentifications. Further collections and study are needed.

Material and methods

Material treated herein is deposited in the Turkish Arachnological Society collection (TASC), in the Zoological Museum of the Moscow State University (ZMMU), Zoological Museum University of Turku (ZMUT), American Museum of Natural History (AMNH), and the reference collection of the first author (RCNS).

All specimens treated here (except for five specimens of *Odiellus lendli* and a few from the AMNH) were collected during a short Turkish-Russian Arachnological expedition during May 27–June 14, 2009. Eight provinces: Ankara, Bolu, Kastamonu, Bursa, İzmir, Aydın, Antalya and Artvin were visited during the collection trip (Map 1). The specimens were collected by litter sifting with the help of an aspirator and preserved in 70% ethanol. The main goal of this trip was to collect spiders and Opiliones were collected only sporadically. Specimens were photographed using an



Map 1. Localities studied during Turkish-Russian Arachnological trip in 2009.

Olympus Camedia C-520 camera attached to an Olympus SZX16 stereomicroscope. The images were montaged using “CombineZM” image stacking software. All measurements are in mm. abbreviations: Fe=femur, Pa=patella, Ti=tibia, Mt=metatarsus, Ta=Tarsus.

Species survey

Sironidae Simon 1879

Cyphophthalmus duricorius bithynicus (Gruber 1969)

(Figs. 1–3)

Siro duricorius bithynicus Gruber 1969, p. 75, f. 1–3.

Material examined. 1♂ (ZMMU), TURKEY [T-09] Bursa, Uludağ National Park, 40°06.970'N 29°03.283'E, 648 m, 1 & 4.06.2009 Yu M. Marusik.

Comments. This subspecies was described and is known so far from only the environs of Bursa. Our specimen came from the type locality.

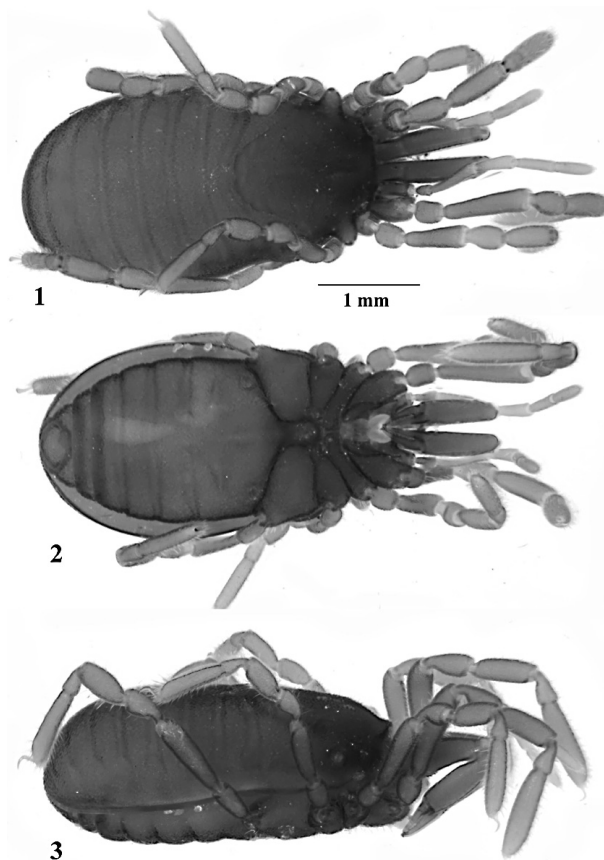
Trogulidae Sundevall 1833

Platybessobius singularis Roewer 1940

Platybessobius singularis: Martens 1966, p. 348; Gruber 1969, p. 82; Mitov 2003, p. 275.

Material examined. 1♂, 1 juv. (ZMMU), TURKEY [T-21/2–3] Artvin Province, Arhavi, 41°22.068'N 41°20.412'E, 225 m, 13.06.2009 Yu M. Marusik.

Comments. This species was described from Crete.



Figs. 1–3. *Cyphophthalmus duricorius bithynicus* (Gruber 1969), male (Bursa, Uludağ National Park). 1. Body, dorsal view; 2. Same, ventral view; 3. Same, lateral view.

Later it was reported from mainland Greece (Chora Fakia) by Martens (1966). Besides these two localities it was found in Turkey (Anatolia) by Gruber (1969).

Dicranolasmatidae Simon 1879

Dicranolasma hoberlandti Šilhavý 1955

Dicranolasma hoberlandti Šilhavý 1955, p. 32, Tab.1, f. 1–8; Martens 1965, p. 67, f. 2–5; Gruber 1969, p. 86; Staręga 1973, pp. 131–132, f. 3–6.

Material examined. 1♂, 1♀ (ZMMU), TURKEY [T-12] Bursa, İnegöl, Great Oylat Cave, 39°56.601'N 29°35.492'E, 519 m, 3.06.2009 Yu. M. Marusik.

Comments. This species has an East Mediterranean range. It was described from Turkey (Suluhan, Taurus). Later it was found in the environs of Bursa (Gruber 1969), in Greece (Rhodos, Martens 1965) and also from Israel (Staręga 1973).

Dicranolasma giljarovi Šilhavý 1966

Dicranolasma giljarovi Šilhavý 1966, p. 153, f. 14–20; Staręga 1978, p. 4; Chevrizov 1979, p. 9, f. 31–34; Bayram & Çorak 2007, p. 9, f. 1 A–H; Çorak & Bayram 2007, p. 457, f. 4–5; Chemeris & Kovblyuk 2005, p. 306, f. 1–8.

Material examined. 1♀ (ZMMU), TURKEY [T-06] Kastamonu, Azdavay, 41°41.938'N 33°25.971'E, 975 m, 30.05.2009 Yu. M. Marusik.

Comments. This species has an East Mediterranean range. It was described from northern Caucasus (Krasnodar Province of Russia) and later was found in Abkhazia (Staręga 1978), Crimea (Chemeris & Kovblyuk 2005), Bulgaria (Staręga 1976) and Turkey (Çorak & Bayram 2007; Bayram & Çorak 2007 (Ankara, Istanbul, Kirikkale, Van).

Dicranolasma sp.

Material examined. 1♂, 1♀, 1 juv. (RCNS), TURKEY [T-01h] Ankara, Kızılcahamam. Soğuksu National Park, Gölü, 40°26.794'N 32°35.476'E, 1608 m, 27.05.2009 Yu. M. Marusik; 2♂♂, 1♀ (RCNS), [T-02] Ankara, between Kızılcahamam—Ankara roads, 40°21.133'N 32°40.811'E, 1000 m, 27.05.2009 Yu. M. Marusik.

Comments. Six species of *Dicranolasma* are known to occur in Turkey: *D. hoberlandti* Šilhavý 1955, *D. giljarovi* Šilhavý 1966, *D. scabrum* (Herbst 1799), *D. ponticum* Gruber 1998, *D. resli* Gruber 1998 and *D. soerenseni* Thorell 1876. Our specimens are most similar to *D. giljarovi* and *D. resli*. At this moment we can not identify them to species level because of lack of comparative material.

Nemastomatidae Simon 1872

Pyza taurica Gruber 1979

Pyza taurica Gruber 1979, p. 566, f. 4, 8, 13, 18.

Material examined. 2♂♂, 4♀♀, 1 juv., TURKEY [T-17b] Antalya, Alanya, Taşatan Plateau, 36°40.521'N 32°10.998'E, 1290 m, 9.06.2009 Yu. M. Marusik.

Comments. This species was described from southern Turkey and known so far only south of the Taurus mountains (Isparta, Burdur, Antalya, Mersin and Niğde Provinces). The species name is derived from the Taurus mountains, but not from Tauri nor Tauria (=Crimean Peninsula).

Paranemastoma superbum Redikorzev 1936

Paranemastoma superbum Redikorzev 1936, p. 40, f. 11–14; Mcheidze 1959, p. 111; Martens 2006, p. 200, f. 29a–f, 30e–f. *Nemastoma supersum*: Staręga 1966, p. 392; Staręga 1978, p. 206.

Material examined. 2♂♂, 1♀, 1 juv. (ZMMU), 1♂ (RCNS), TURKEY [T-21/2-3] Artvin, Arhavi, 41°22.068'N 41°20.412'E, 225 m, 13.06.2009 Yu. M. Marusik.

Comments. This species has an east Mediterranean range. It was described from Ajaria (SE Georgia) an area which is adjacent to Artvin Province. Later it was reported from different parts of Georgia (Mcheidze 1959, 1964; Staręga 1966; Martens 2006) and in two localities in Turkey (Martens 2006: East Pontus Mountains and Kaçkar Mountains).

Histicostoma mitovi sp. n.

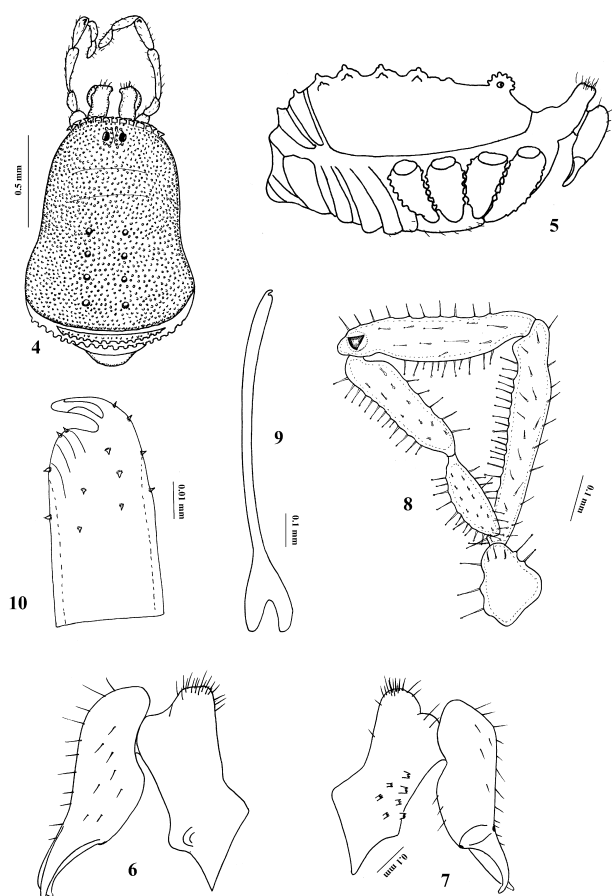
(Figs. 4–10)

Material examined. Holotype♂ (ZMMU) and paratypes 1♂ (RCNS), 1♀ (ZMMU), TURKEY [T-12] Bursa, İnegöl, Great Oylat Cave, 39°56.601'N 29°35.492'E, 519 m, 3.06.2009 Yu. M. Marusik.

Etymology. The species is being named in honor of the European specialist on Opiliones – Dr. Plamen Mitov.

Diagnosis. The new species is closely related to *H. caucasicum* (Redikorzev 1936) and *H. creticum* (Roewer 1927), but differs by the following aspects: in *H. mitovi* sp. n.: with blunt tubercles on tergites similar to those in *Mediostoma* species, *H. caucasicum* and *H. creticum* have cylindrical tubules, with tips formed by pointed denticle groups. In *H. mitovi* sp. n. the glans of the penis have other structure, than in *H. caucasicum* and *H. creticum*. In *H. caucasicum* the femora and patella of the pedipalp are thinner and longer, than in *H. mitovi* sp. n. In *H. creticum* the retrolateral side of the cheliceral segment I with numerous small black denticles, in *H. mitovi* sp. n. such denticles are absent.

Description. *Male* (holotype). Body 1.4 long, 0.9 wide;



Figs. 4–10. *Histricostoma mitovi* sp. n., male holotype (Nursa, Inegöl, Great Oylat Cave). 4. Body, dorsal view; 5. Same, lateral view; 6. Right chelicera, prolateral view; 7. Same, retrolateral view; 8. Right pedipalp, prolateral view; 9. Penis, overall view; 10. Glans of penis, lateral view.

quadrangular with rounded angles, slightly widened posteriorly, with four pairs of small blunt denticles. Whole body surface granulated, dorsal outline of the body with bifid denticles. Anterior edge of the carapace with 12–15 “T”-shaped denticles. Carapace and coxae outlines with the same denticles. Body and chelicerae dark-brown. Eye mound rounded, low, covered with granules. Legs relatively long, especially II and IV. Femora I and III thickened. Leg pseudoarticulations: I – 1–1, II – 6–5, III – 2–2, IV – 3–4. Lengths of palp and leg segments as in Table 1.

Distal segment of chelicerae with setae, basal segment covered with rows of denticles retrolaterally. Distal segment without a low apophysis, small hollow are on top surrounded by long setae. Cheliceral lengths: basal segment 0.43, distal segment 0.50. Pedipalps dark-brown, covered with pointed and capitate setae. Terminal part of patella with large recurved retrolateral hook-shaped tooth. Shape of penis typical for *Histricostoma*. Penis length 1.07.

Female. Similar to male, but differs by having a wider abdomen posteriorly, both the cheliceral gland and tooth on pedipalps are not present. Body 1.65 long, 1.10 wide. Cheliceral lengths: basal segment 0.4, distal 0.5. Leg

pseudoarticulations: I – 1–1, II – ?–4, III – 2–2, IV – 4–4. Lengths of palp and leg segments as in Table 1.

Comparative material. *Histricostoma creticum* (Roewer 1927): 2♂, 1♀, 2 juv. (SMF #17081/5), Karpathos: oberhalb Mertonas, 17.04.1964, leg. J. Martens. *Histricostoma caucasicum* (Redikorzev 1936): 42♂, 41♀ (IZB 245), 15 km NNE from Zakataly, between I and II cordon, mountain slopes along right bank of the River Katekhchai, 800 m, 05.07.2004, leg. N. Snegovaya.

***Histricostoma gruberi* sp. n.**
(Figs. 11–17)

Material examined. Holotype♂ (ZMMU) and paratypes 1♂, 1♀ (RCNS), 2♂♂, 2♀♀ (TASC), 3♂♂, 2♀♀ (ZMMU), TURKEY [T-15] Aydın, Kuşadası, Dilek Peninsula Büyük Menderes Delta National Park, 37°41.735'N 27°09.802'E, 106 m, 7.06.2009 Yu. M. Marusik.

Etymology. The species has been named in honour of the famous European specialist in Opiliones – Dr. J. Gruber, who worked with the fauna of Turkey.

Diagnosis. The new species is most similar to *H. caucasicum*, but differs from it by having 5 pairs of tubercles (4 pairs in *H. caucasicum*). Eye mound in *H. gruberi* sp. n. is covered by large curved bifid tubercles whereas in *H. caucasicum* it is covered by small tubercles. In *H. gruberi* sp. n. the glans of the penis have other structure, than in *H. caucasicum*. In *H. caucasicum* the femur and patella of pedipalp are longer and thinner, than these in *H. gruberi* sp. n.

Description. **Male** (holotype). Body 1.65 long, 1.0 wide. Body elongated-quadrangular with rounded edges. Abdominal part widened. Tergites I–V with five pairs of cylindrical tubercles slanting posteriorly, tips of tubercles with group of fine papilliform denticles. Eye mound elevated, rounded, covered with large denticles with tops that are recurved and somewhat hooked. Frontal edge of carapace with double/triple rows of blunt “T” shaped tubercles. Dorsum and venter with granulations, venter with setae. Coxae bordered with “T”-shaped tubercles. Legs relatively short, I and III thickened, densely covered with granules. Leg pseudoarticulations: I – 1–1, II – 8–6, III – 2–2, IV – 4–5. Lengths of palp and leg segments as in Table 2.

Chelicera dark-brown. Distal segment covered with setae. Basal segment with wide appendage, having a small deepening, densely covered with long setae. Basal segment dorsally and ventrally densely covered with group (brush-like) of denticles. Cheliceral lengths: basal segment 0.57, distal 0.57. Pedipalps light-brown, covered with pointed and capitate setae. Patella retrolaterally with triangular hook; tip of which recurved. Penis 1.29 long.

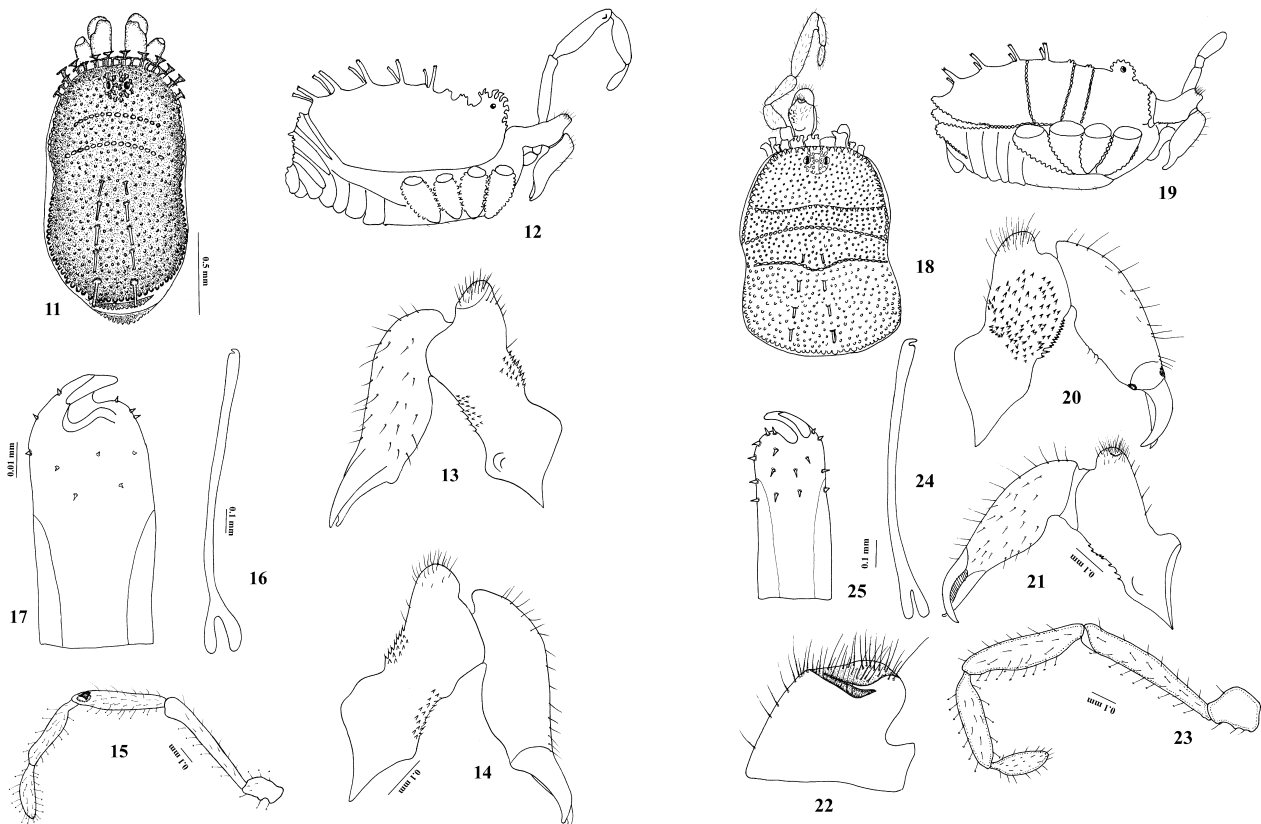
Female. Similar to male, but differs by wider body and absence of cheliceral modifications and gland. Body (paratype) 1.9 long, 1.25 wide. Basal segment of chelicera 0.4 long, distal – 0.65 long. Length of palp and leg segments as in Table 2.

Table 1. Lengths of palp and leg segments of *Histicostoma mitovi* sp. n.

	Male						Female					
	Fe	Pa	Ti	Mt	Ta	Total	Fe	Pa	Ti	Mt	Ta	Total
Palp	0.6	0.5	0.4	—	0.25	1.75	0.6	0.5	0.4	—	0.25	1.75
Leg I	0.63	0.25	0.43	0.36	0.58	2.25	1.05	0.35	0.85	1.5	1.15	4.9
Leg II	1.05	0.3	0.75	1.25	1.15	4.5	0.7	0.28	0.5	0.75	0.65	2.88
Leg III	0.63	0.28	0.45	0.75	0.5	2.61	1.0	0.25	0.65	1.25	0.7	3.85
Leg IV	0.88	0.25	0.55	1.13	0.75	3.56	0.65	0.28	0.45	0.7	0.7	2.78

Table 2. Lengths of palp and leg segments of *Histicostoma gruberi* sp. n.

	Male						Female					
	Fe	Pa	Ti	Mt	Ta	Total	Fe	Pa	Ti	Mt	Ta	Total
Palp	0.71	0.57	0.42	—	0.28	1.98	0.63	0.63	0.45	—	0.35	2.06
Leg I	1.0	0.4	0.65	1.3	0.9	4.25	1.0	0.35	0.65	1.2	1.0	4.2
Leg II	1.9	0.7	0.8	2.8	2.0	8.2	1.75	0.4	1.25	2.63	1.63	7.66
Leg III	1.1	0.53	0.65	1.4	0.9	4.58	1.13	0.35	0.65	1.38	0.88	4.39
Leg IV	1.8	0.38	0.95	2.05	1.3	6.48	1.75	0.38	0.88	2.0	1.15	6.16



Figs. 11–17. *Histicostoma gruberi* sp. n., male holotype (Aydın, Kuşadası, Dilek Peninsula Büyük Menderes Delta National Park). 11. Body, dorsal view; 12. Same, lateral view; 13. Right chelicera, prolateral view; 14. Same, retrolateral view; 15. Right pedipalp, prolateral view; 16. Penis, overall view; 17. Glans of penis, lateral view.

Figs. 18–25. *Histicostoma creticum* (Roewer 1927), male (Antalya, Alanya, Taşatan Plateau). 18. Body, dorsal view; 19. Same, lateral view; 20. Right chelicera, retrolateral view; 21. Same, prolateral view; 22. Cheliceral apophysis, prolateral view; 23. Right pedipalp, prolateral view; 24. Penis, overall view; 25. Glans of penis, lateral view.

Martens 1965, p. 67.

Histicostoma creticum: Gruber 1978, p. 568.

Histicostoma creticum (Roewer 1927)
(Figs. 18–25)

Nemastoma creticum Roewer 1927, p. 454, fig. 1.

Mitostoma creticum: Roewer 1951, p. 148; Roewer 1959, p. 38;

Material examined. 2♂♂, TURKEY [T-17a] Antalya, Alanya, Taşatan Plateau, 36°38.498'N 32°04.089'E, 1167 m, 9.06.2009 Yu. M. Marusik.

Description. *Male.* Body 1.5 long, 1.1 wide. Body

rectangular with rounded angles, from dark- to light-brown. Frontal edge of cephalothorax with bifid tubercles. Same tubercles situated on borders between merged tergites. Whole body covered with small grains. Tergites II–V with pairs of cylindrical denticles, tips of which bear group of papilla-like tubercles. Eye mound rounded, covered with quadrangular tubercles. Legs relatively short, femora of all legs with small black denticles, femora I spindle-shaped. Legs pseudoarticulations – 1–5–2–4. Length of palps and legs segments as in Table 3.

Chelicera small, basal segment with small black denticles retrolaterally, densely covering all segment surfaces; with gland which prolaterally bears a small depression, densely covered with long setae. Distal segment covered with setae. Basal segment of chelicera 0.5 mm long, distal 0.55 mm long. Pedipalps short, covered with pointed and capitate setae. Patella top with large hook-like recurved. Penis 1.1 long.

Histicostoma caucasicum (Redikorzev 1936)

Nemastoma caucasicum Redikorzev 1936, p. 37, f. 7–8, 14; Roewer 1951, p. 135.

Histicostoma (*Histicostoma*) *caucasicum*: Starega 1966, p. 394.

Histicostoma caucasicum: Starega 1978, p. 201; Martens 2006, p. 192, f. 21a–b, 26–27.

Material examined. 1♀ (ZMMU), TURKEY [T-19] Artvin, Şavşat, Meydancık, Erikli Village, 41°24.302'N 42°17.809'E, 1141 m, 12.06.2009 Yu. M. Marusik; 1♀ (TASC), TURKEY [T-20] Artvin, 9 km NNW of Artvin, 41°15.642'N 41°46.365'E, 225 m, 13.06.2009 Yu. M. Marusik.

Comments. This species has a Caucasian range. It was described from Abkhazia. Later *H. caucasicum* was reported from different parts of Georgia (Mcheidze 1964; Starega 1966; Martens 2006), Azerbaijan (Snegovaya & Chemeris 2005; Martens 2006), Armenia (Martens 2006) and Northern Caucasus (Krasnodar Province of Russia, Martens 2006). It was already reported by Martens (2006) from Turkey, from the same province (Artvin, Kackar Mountains).

Sclerosomatidae Simon 1879

Nelima pontica Charitonov 1941

Nelima pontica Charitonov 1941, p. 169, f. 5–6; Starega 1966, p. 406, f. 22; Martens 1969, p. 412, f. 53–54, 57; Starega 1978,

p. 209; Chevrizov 1979, p. 16, f. 69–70; Mitov 1995, p. 64; Mitov 1997, p. 102, f. 9 b, d; Kunt & Yıldız 2010, p. 11, 18, f. 11.

Material examined. 1♂, 1♀ (ZMMU), TURKEY [T-06] Kastamonu, Azdavay, 41°41.938'N 33°25.971'E, 975 m, 30.05.2009 Yu. M. Marusik.

Comments. This species was described from Abkhazia and later it was reported from western Georgia (Mcheidze 1952, 1964; Starega 1966), adjacent Russia (Sochi, Birshtein 1950), Bulgaria (Mitov 1995, 1997) and also from Turkey (Kunt & Yıldız 2010).

Nelima sp.

Material examined. 1♂ (RCNS), TURKEY [T-06] Kastamonu, Azdavay, 41°41.938'N 33°25.971'E, 975 m, 30.05.2009 Yu. M. Marusik.

Comments. The single male we have has broken penis, therefore it cannot be correctly identified. Members of this genus are not known from Turkey, but in the adjacent Caucasus there are two species recorded: *Nelima pontica* and *N. doriae* (Canestrini 1872).

Phalangiidae Latreille 1802

Odiellus zecariensis Mcheidze 1952

Odiellus zecariensis Mcheidze 1952, p. 546, fig. 2; Mcheidze 1959, p. 112; Starega 1966, p. 397, f. 12–14; Starega 1978, p. 213; Chevrizov 1979, p. 18, f. 92–93; Chemeris & Kovblyuk 2005, p. 314, f. 27–33.

Material examined. 6 juv. (ZMMU), TURKEY [T-19] Artvin, Şavşat, Meydancık, Erikli Village, 41°24.302'N 42°17.809'E, 1141 m, 12.06.2009 Yu. M. Marusik; 5 juv. (ZMMU), [T-21/2-3] Artvin, Arhavi, 41°22.068'N 41°20.412'E, 225 m, 13.06.2009 Yu. M. Marusik.

Comments. While we have only juvenile specimens, we are sure of the identification because we have comparative material from Caucasus that contains both adult and juvenile specimens and it is a distinctive species. This species is new for the fauna of Turkey. It was described from central-eastern Georgia. Later it was found in Ajaria, Abkhazia, Stavropol and Krasnodar Provinces in Russia and also in Crimea (cf. Chemeris & Kovblyuk 2005). Finding this species in Turkey is not a surprise, because it was known from the adjacent Ajaria. In general this species is restricted to the western Caucasus and Crimea.

Odiellus lendli (Soerensen 1894)

Odiellus lendli: Martens 1978, p. 343, f. 651–656, 642.

Odiellus bieniaszi (Kulczyński 1909): Starega 1966, p. 395, f. 9–11.

Odiellus bieniaszi: Starega 1978, p. 213; Snegovaya 1999, pp. 453–454, f. 14–18; Snegovaya 2002, p. 231.

Table 3. Lengths of palp and leg segments of *Histicostoma creticum* (Roewer 1927) (male).

	Fe	Pa	Ti	Mt	Ta	Total
Palp	0.6	0.5	0.35	—	0.25	1.7
Leg I	0.8	0.35	0.6	0.85	0.8	3.4
Leg II	1.25	0.4	1.1	1.9	1.45	6.1
Leg III	0.85	0.35	0.6	1.0	0.7	3.5
Leg IV	1.15	0.4	0.75	1.4	1.1	4.8

Odiellus lendli: Kurt & Erman 2011, p. 1265–1270, f. 1–8.

Material examined. 8♀ (ZMUT), Bithynia, Hendek-Gümüşova, ca 40°50'N 30°45'E, 10.09.1977 P. T. Lehtinen.

Comments. This Opiliones is known all over Europe and east to the Caucasus. This is a widely distributed species, also reported from Turkey (Kurt & Erman 2011).

Lacinius sp.

Material examined. 6 juv. (ZMMU), TURKEY [T-13] İzmir, Kemalpaşa, Vişneli, (Fetrek-2 Cave), 38°20.777'N 27°25.271'E, 311 m, 5.06.2009 Yu. M. Marusik.

Comments. The juvenile specimens of this genus can not be identified to species level with certainty. Another species, *L. ephippiatus* (C. L. Koch 1885) was already reported from Turkey (Çorak et al. 2008) and another similar looking species, *L. erinaceus* Starega 1966 is known from Abkhazia.

Rilaena anatolica (Roewer 1956)
(Figs. 26–36)

Platybunus anatolicus Roewer 1956, p. 303, f. 174–176.

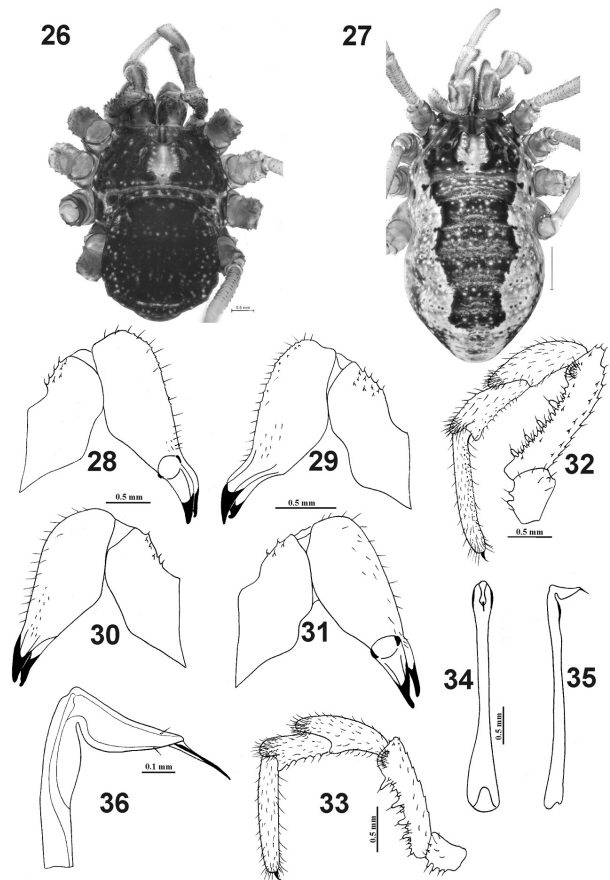
Rilaena anatolica: Starega 1973, p. 143.

Material examined. 6♂♂, 2♀♀, 1 juv. (ZMMU), 2♂♂, 1♀ (RCNS), 2♂♂, 1♀ (TASC), TURKEY [T-06] Kastamonu, Azdavay, 41°41.938'N 33°25.971'E, 975 m, 30.05.2009 Yu. M. Marusik.

Note. We redescribe this species in detail because it is otherwise only known by the original description.

Description. *Male.* Body 5.0 long, 3.2 wide; quadrangular, dark-brown, almost black, with numerous small light spots; covered with rows of denticles along margins of tergites. Groups of same sized denticles are in front of eye mound and along carapace edges. Supracheliceral lamellae with one denticle per side. Eye mound wide (1.0) with 10–11 denticles around the top and outer sides of the ring. Legs short, pair I thickened. Femora of all legs with small denticles. Legs light-brown. Length of palp and leg segments as in Table 4.

Venter dark-brown, covered with setae; genital operculum lighter. Chelicerae large, dark-brown. Basal segment of chelicerae 2.0 long, distal – 2.3 long. Basal segment dorsally with some denticles. Distal segment dorsally with denticles and setae. Pedipalps dark-brown; femora



Figs. 26–36. *Rilaena anatolica* (Roewer 1956), male and female (Kastamonu, Azdavay). 26. Male body, dorsal view; 27. Female body, dorsal view; 28. Male right chelicera, retrolateral view; 29. Same, prolateral view; 30. Female right chelicera, prolateral view; 31. Same, retrolateral view; 32. Male right pedipalp, prolateral view; 33. Female right pedipalp, prolateral view; 34. Penis, ventral view; 35. Same, lateral view; 36. Glans of penis, lateral view.

ventrally with small and much larger denticles, dorsally with denticles; patella covered with setae and with apophysis densely covered with setae Tibiae with small apophyses, also densely covered with setae, ventrally with small denticles. Tarsus with ventral granulations. Penis typical for Phalangiinae, truncus spoon-shaped with glans bent ventrally. Penis 3.1 long, glans 0.4 long and stylus 0.2 long.

Female. Similar to male, but differs by being longer and having a rounded body with dark-brown saddle mark. Femora I less thickened than in males. Body 6.2 long and

Table 4. Lengths of palp and leg segments of *Rilaena anatolica* (Roewer 1956).

	Male						Female					
	Fe	Pa	Ti	Mt	Ta	Total	Fe	Pa	Ti	Mt	Ta	Total
Palp	1.75	1.25	1.1	—	1.6	5.7	1.3	1.2	1.0	—	1.5	5.0
Leg I	3.1	1.1	2.8	2.1	3.9	13.0	2.0	1.0	1.8	2.1	4.2	11.1
Leg II	4.5	1.5	4.0	4.5	7.6	22.1	4.0	1.75	3.7	4.1	7.5	21.05
Leg III	3.3	1.2	2.75	3.5	4.7	15.45	2.8	1.0	2.25	3.5	4.3	13.85
Leg IV	4.5	1.4	3.5	6.0	6.8	22.2	4.0	1.1	3.2	5.3	5.6	19.2

3.1 wide. Females differ from males by the broader body, lighter coloration, less thickened leg I, thinner and almost not armed pedipalps. Basal segment of chelicera 1.5 long, distal – 1.75 long. Lengths of palp and leg segments as in Table 4.

Comments. The species was described and known from the environs of only Ankara. Our new find extends the known range about 250 km to the north.

Zachaeus crista (Brullé 1832)

Zachaeus crista: Roewer 1923, p. 820, fig. 1023; Šilhavý 1965, p. 384, Tab III–V f. 1–4; Martens 1965, p. 71; Staręga 1976, p. 372, f. 71–73; Martens 1978, p. 301, f. 559, 567; Çorak & Bayram 2007, p. 456.

Material examined. 1 juv. (ZMMU), TURKEY [T-09] Bursa, Uludağ National Park, 40°06.970'N 29°03.283'E, 648 m, 1 & 4.06.2009 Yu. M. Marusik; 2♂♂, 1♀ (RCNS), [T-10] Bursa, Nilufer, 40°07.466'N 28°42.105'E, 570 m, 2.06.2009 Yu. M. Marusik; 2♂♂, 3♀♀, (ZMMU) [T-13] İzmir, Kemalpaşa, Vişneli, (Fetrek-2 Cave), 38°20.777'N 27°25.271'E, 311 m, 5.06.2009 Yu. M. Marusik. 1♀ (AMNH), İzmir, Bergama (=Ancient Pergamon), 18–21.05.1981 B. Malkin.

Comments. It is a widespread European species. In Turkey this species was first reported by Roewer (1956).

Zachaeus anatolicus Kulczyński 1903

Egaenus crista var. *anatolicus* Kulczyński 1903, p. 660.

Zachaeus anatolicus: Šilhavý 1955, p. 34, f. 1–5; Staręga 1976, p. 376, f. 75–77; Chevrizov 1979, p. 22, f. 119–121.

Metaphalangium kratochvili Šilhavý 1965, p. 394, Tab. II, f. 1–13.

Material examined. 1♂ (RCNS), TURKEY [T-02] Ankara, between Kızılcahamam–Ankara roads, 40°21.133'N 32°40.811'E, 1000 m, 27.05.2009 Yu. M. Marusik.

Comments. This species has an eastern Mediterranean range. It was originally described from Turkey and later found in Caucasus, Greece, Bulgaria, and Yugoslavia. Record of this species from Crimea (cf. Chevrizov 1979) seems to refer to *Z. simferopolensis* Chemeris & Kovblyuk 2005.

Opilio insulae Roewer 1956
(Figs. 37–43)

Opilio insulae Roewer 1956, p. 288, f. 128–130; Martens 1965, p. 69, f. 9–19; Staręga 2003, p. 97.

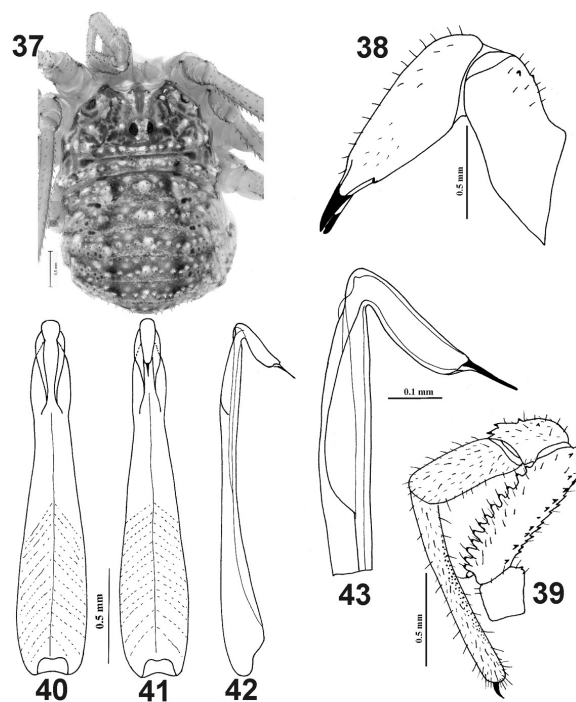
Opilio lindosiellus: Gruber 1963, p. 312.

Material examined. 1♂ (ZMMU), TURKEY [T-14] İzmir, Karaburun, 1 km N of Parlak Village, 38°36.016'N 26°23.254'E, 170 m, 6.06.2009 Yu. M. Marusik; 1♂ (ZM-

MU), 1♂ (TASC), 1♂ (RCNS), [T-15] Aydın, Kuşadası, Dilek Peninsula, Büyük Menderes Delta National Park, 37°41.735'N 27°09.802'E, 106 m, 7.06.2009 Yu. M. Marusik.

Note. We redescribe this species because it is relatively poorly known, and is a new species for Turkey.

Description. *Male.* Body 3.3 long, 2.1 wide; short, surface with numerous small light-brown and dark-brown spots. Whole body with rows of black-tipped tubercles. In front of eye mound with groups of black-tipped tubercles. Eye mound small, round, each ring with 4–5 denticles. Venter and coxae yellow, covered with setae. Chelicerae small, yellow; basal segment with several black-tipped tubercles and setae dorsally; distal segment with setae. Basal segment of chelicera 1.1 long, distal – 1.25 long. Pedipalps yellow, femora with large spine-tipped tubercles and setae ventrally and with black-tipped tubercles and setae dorsally. Patellae with small denticles and setae dorsally, other parts with setae only; tibia with spines and setae; tarsus with setae and with fine denticles ventrally. Legs long, femora of all legs with transverse rows of denticles; femora I spindle-



Figs. 37–43. *Opilio insulae* Roewer 1956, male (İzmir, Karaburun). 37. Body, dorsal view; 38. Right chelicera, prolateral view; 39. Right pedipalp, prolateral view; 40. Penis, dorsal view; 41. Seme, ventral view; 42. Same, lateral view; 43. Glans of penis, lateral view.

Table 5. Lengths of palp and leg segments of *Opilio insulae* Roewer 1956 (male).

	Fe	Pa	Ti	Mt	Ta	Total
Palp	0.88	0.38	0.55	—	1.15	2.96
Leg I	2.8	0.8	2.5	2.7	4.7	13.5
Leg II	6.0	1.2	1.8	3.5	15.7	28.2
Leg III	3.1	0.9	2.5	3.0	5.3	14.8
Leg IV	4.6	1.0	3.6	4.2	7.8	21.2

shaped; femora I and III pairs thickened. Lengths of palp and leg segments as in Table 5. Penis light coloured, widened in the base, tapering to the top, with small wings. Penis 1.9 long, glans 0.28 long, and stylus 0.1 long.

Comments. This species is new to the fauna of Turkey. It was described from Greece (Samos, and island close to Turkey). Besides Samos it was found on Chios, Ikaria, Krete, Karpathos, Lesbos, Rhodes and Symi (Martens 1965, 1966; Gruber 1978), so it was not a surprise to find this species on Aegean shore of Turkey a few kilometers from the type locality. Gruber (1978: 572) wrote about the occurrence of *O. insulae* in Izmir Province, but provided no details about the material or literature references.

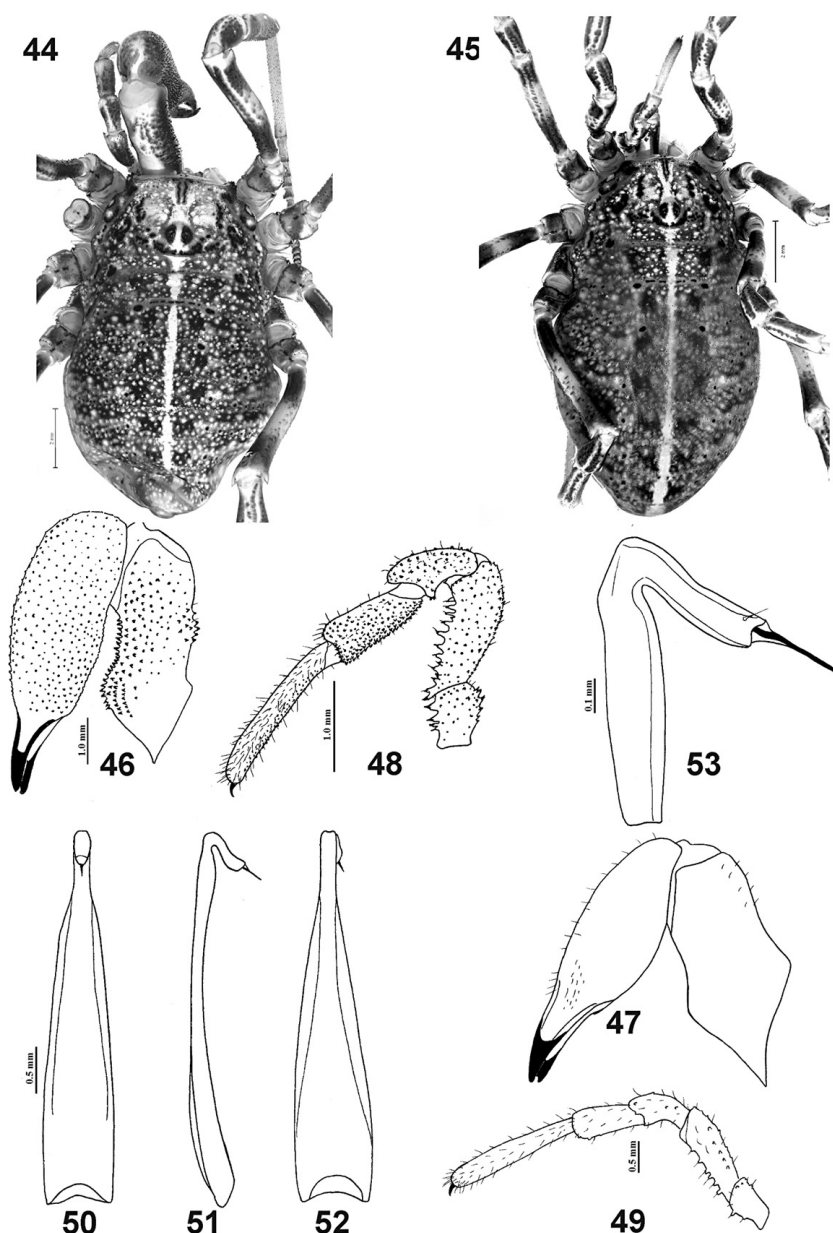
Opilio parientinus (De Geer 1778)

Material examined. 2♂♂ (AMNH), TURKEY, Ankara, 1000 m, garage near garden, 13.11.1960, R. Walsh.

Comments. This is a widely distributed species previously reported from Turkey by Çorak & Bayram (2007).

Opilio sp.

Material examined. 1♂, 1 juv. (AMNH), TURKEY, Antalya, Arif (=Ancient Arikanda), 700 m, 10.05.1981 B. Malkin. 1♂, 3♀♀ (AMNH), Antalya, Kas, 5–7.05.1981 B.



Figs. 44–53. *Egaenus turcicus* sp. n., male holotype and female paratype (Bursa, Nilüfer). 44. Male body, dorsal view; 45. Female body, dorsal view; 46. Male right chelicera, prolateral view; 47. Female right chelicera, prolateral view; 48. Male right pedipalp, prolateral view; 49. Female right pedipalp, prolateral view; 50. Penis, ventral view; 51. Same, lateral view; 52. Same, dorsal view; 53. Glans of penis, lateral view.

Table 6. Lengths of palp and leg segments of *Egaenus turcicus* sp. n.

	Male						Female					
	Fe	Pa	Ti	Mt	Ta	Total	Fe	Pa	Ti	Mt	Ta	Total
Palp	2.0	1.2	1.5	—	2.3	7.0	1.5	0.9	0.5	—	2.0	5.4
Leg I	4.0	2.0	3.0	3.5	5.3	18.0	3.0	1.5	2.25	3.0	5.0	14.75
Leg II	5.5	2.0	4.0	4.6	9.0	25.1	4.3	1.75	3.4	3.5	8.8	21.75
Leg III	4.0	2.0	3.0	4.0	6.0	19.0	3.1	1.5	2.3	3.25	5.25	15.4
Leg IV	5.4	2.0	3.8	6.2	8.2	25.6	4.75	2.0	3.2	5.7	7.1	22.75

Malkin. 2 juv. (AMNH), Antalya, Ancient Myra, 8.05.1981
B. Malkin. 2♂♂ Antalya, Ancient Phaselis, 13–14.05.1981,
B. Malkin.

Comments. These represent a new record for Turkey and possibly a new species. Further study is needed. Maybe this is *O. validus* Roewer, 1959; which has not been recollected since the original collection from an unspecified locality in Turkey.

Egaenus turcicus sp. n.
(Figs. 44–53)

Material examined. Holotype♂ (ZMMU) and paratypes 1♂ (RCNS), 1♀ (ZMMU) TURKEY [T-10] Bursa, Nilufer, 40°07.466'N 28°42.105'E, 570 m, 2.06.2009 Yu. M. Marusik.

Etymology. The species is named after its type locality – Turkey.

Diagnosis. The species is most similar to *E. convexus* and can be separated from it by the penis with widened base, tapering to the tip (parallel sides in *E. convexus*) and by elongated glans with almost parallel sides (oval in *E. convexus*). In *E. turcicus* sp. n. the denticles are evenly distributed in the frontal part of carapace, whereas in *E. convexus* these denticles are concentrated in front of the eye tubercle. *E. convexus* has a broken transversal band of light pigment, whereas in the new species it is continuous. The general colouration in *E. convexus* is dark-brown and light brown in *E. turcicus* sp. n.

Description. *Male* (holotype). Body 11.0 long, 5.5 wide; large, entire body covered with fine denticles. Anterior part of carapace in front of eye mound with large microgranules. Median light stripe runs from eye tubercle to posterior part of opisthosoma. Eye tubercle low, with light median stripe and with rows of microdenticles on each side. Body brown with numerous small and round light spots. Venter light-brown, covered with small setae. Legs short, femora I and III slightly thickened; brown with white longitudinal stripe. Lengths of palp and leg segments as in Table 6.

Chelicerae very large, dark-brown. Basal segment densely covered with large denticles ventrally and dorsally; whole distal segment covered with fine denticles. Basal segment of chelicera 4.6 long, distal – 6.3 long. Pedipalps relatively large, dark-brown; femora ventrally with large spine-tipped tubercles, dorsally with black-tipped tubercles and laterally with small denticles; patella covered with small

black-tipped tubercles; tibia ventrally densely covered with denticles, laterally with denticles; tarsus covered with setae and ventrally with fine denticles. Penis with wide base tapering to the glans. Glans banana-shaped with almost uniform width throughout. Length of penis 3.8, glans 0.5, stylus 0.25.

Female. Body 11.4 long, 5.2 wide. Basal segment of chelicera 2.5 long, distal – 3.0 long. Legs light-brown. Lengths of palp and leg segments as in Table 6. Female differs from male by the larger size of the body, smaller chelicerae and pedipalps; as well as less armed with denticles. Legs smoother than in males.

Comparative material. *Egaenus convexus* C. L. Koch 1835, 1♂ (RCNS), Serbia, Kragujevac, Šumarica, 10.05.1981, I. Karaman.

Comments

Before this study a total of 64 species and subspecies of Opiliones were known from Turkey (Kurt et al. 2010). Adding the species new to science and new records for the fauna of the country, the total number for the country is now 72 species. Species diversity in the country is rather high in comparison to adjacent countries. About 55 species are known in Bulgaria, 40–45 species have been reported from Azerbaijan. Among neighboring countries only Greece has more species (about 75). Taking into account the large size of Turkey and diversity in landscapes, it is easy to suggest that true species richness in Turkey could be 20–30 species higher.

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